Test Design Factors:

- The central activity in test design is to identify inputs to and the expected outcomesfrom a system to verify whether the system possesses certain features.
- A featureis a set of related requirements. The test design activities must be performed ina planned manner in order to meet some technical criteria, such as effectiveness, and economic criteria, such as productivity.
- Therefore, we consider the following factors during test design:
  - (i) coverage metrics,
  - (ii) effectiveness
  - (iii) productivity,
  - (iv) Validation
  - (v) maintenance, and
  - (vi) user skill.

i. **Coverage metrics** concern the extent to which the DUT is examined by a test suite designed to meet certain criteria. Coverage metrics lend us two advantages. First, these allow us to quantify the extent to which a test suite covers certain aspects, such as functional, structural, and interface of a system. Second, these allow us to measure the progress of system testing. The criteria may be path testing, branch testing, or a feature identified from a requirement specification.

ii. **Effectiveness and Productivity:** A structured test case development methodology must be used as much as possible to generate a test suite. A structured development methodology also minimizes maintenance work and improves productivity. Careful design of test cases in the early stages of test suite development ensures their maintainability as new requirements emerge.

iii. **Validation:** The correctness of the requirements is very critical in orderto develop effective test cases to reveal defects. Therefore, emphasis must be put on identification and analysis of the requirements from which test objectives are derived. Test cases are created based on the test objectives. Another aspect of test case production is validation of the test cases to ensure that those are reliable. Itis natural to expect that an executable test case meets its specification before it is used to examine another system. This includes ensuring that test cases have ade- quate error handling procedures and precise pass–fail criteria.

iv. **Maintenance:** We need to developa methodology to assist the production, execution, and maintenance of the test suite. Another factor to be aware of is the potential users of the test suite.

User skill: The test suite should be developed with these users in mind; the test suite must be easy to deploy and execute in other environments, and the procedures for doing so needto be properly documented